

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A paper quality improver for papermaking, comprising a copolymer (A) having a constituent unit derived from at least one nonionic monomer having a solubility parameter of $20.5 \text{ (MPa)}^{1/2}$ or less and a constituent unit derived from at least one anionic or cationic ~~monomer monomer~~, and a surfactant (B) at an (A)/(B) ratio in the range of 99/1 to 1/99 (weight ratio), the quality improver providing at least one paper quality improving effect of the followings (i), (ii), and (iii):

(i) standard improved bulky value: 0.02 g/cm^3 or more;

(ii) standard improved opacity: 1.0 point or more; and

(iii) standard improved brightness: 0.5 point or ~~[[more]]~~ more;

wherein the copolymer (A) further comprises a constituent unit derived from at least one nonionic unsaturated monomer having a solubility parameter of $26.6 \text{ (MPa)}^{1/2}$ or more; and

wherein, as the contents of the constituent monomers, the copolymer (A) comprises:

5 to 84% by weight of the nonionic monomer having a solubility parameter of $20.5 \text{ (MPa)}^{1/2}$ or less,

1 to 80% by weight in total of the anionic monomer and the cationic monomer, and

15 to 94% by weight of the nonionic unsaturated monomer having a solubility parameter of $26.6 \text{ (MPa)}^{1/2}$ or more.

2. (Currently Amended) A paper quality improver for papermaking, comprising a copolymer (A) having a constituent unit derived from at least one nonionic unsaturated monomer having a solubility parameter of $20.5 \text{ (MPa)}^{1/2}$ or less and a constituent unit derived from at least

one anionic or cationic ~~monomer~~ monomer, and a surfactant (B) at a rate in the range of (A)/(B) ~~[[=99/1]]~~ of 99/1 to 1/99 (weight ratio), the quality improver providing at least one paper quality improving effect of the followings (i), (ii), and (iii):

- (i) standard improved bulky value: 0.02 g/cm^3 or more;
- (ii) standard improved opacity: 1.0 point or more; and
- (iii) standard improved brightness: 0.5 point or ~~[[more]]~~ more;

wherein the copolymer (A) further comprises a constituent unit derived from at least one nonionic unsaturated monomer having a solubility parameter of $26.6 (\text{MPa})^{1/2}$ or more; and

wherein, as the contents of the constituent monomers, the copolymer (A) comprises: 5 to 84% by weight of the nonionic unsaturated monomer having a solubility parameter of $20.5 (\text{MPa})^{1/2}$ or less,

1 to 80% by weight in total of the anionic monomer and the cationic monomer, and 15 to 94% by weight of the nonionic unsaturated monomer having a solubility parameter of $26.6 (\text{MPa})^{1/2}$ or more.

3. (Currently Amended) A paper quality improver for papermaking, comprising a copolymer (A) having a constituent unit derived from at least one nonionic monomer having a solubility parameter of $20.5 (\text{MPa})^{1/2}$ or less in a total amount of 5 to 84% by weight in the polymer and a constituent unit derived from at least one anionic or cationic monomer in a total amount of 1 to 80% by weight in the ~~polymer~~ polymer, and a surfactant (B) at an (A)/(B) ratio in the range of 99/1 to 1/99 ~~(weight-ratio)~~ (weight ratio);

wherein the copolymer (A) further comprises a constituent unit derived from at least one nonionic unsaturated monomer having a solubility parameter of $26.6 \text{ (MPa)}^{1/2}$ or more; and

wherein, as the contents of the constituent monomers, the copolymer (A) comprises:
5 to 84% by weight of the nonionic monomer having a solubility parameter of $20.5 \text{ (MPa)}^{1/2}$ or less,

1 to 80% by weight in total of the anionic monomer and the cationic monomer, and
15 to 94% by weight of the nonionic unsaturated monomer having a solubility parameter of $26.6 \text{ (MPa)}^{1/2}$ or more.

4. (Cancelled)

5. (Cancelled)

6. (Previously Presented) The paper quality improver for papermaking according to claim 1, wherein one of the constituent monomers of copolymer (A) further comprises a crosslinkable constituent monomer.

7. (Previously Presented) The paper quality improver for papermaking according to claim 1, wherein the HLB of the surfactant (B) is in the range of -5 to 15.

8. (Currently Amended) The paper quality improver for papermaking according to claim 1, wherein the surfactant (B) is nonionic or the surfactant (B) is cationic.

9. (Currently Amended) The paper quality improver for papermaking according to claim 1, wherein the surfactant (B) is ~~a surfactant selected from alcohols and an~~ alcohol alkylene oxide ~~adducts~~ adduct containing an alkylene oxide group having 2 to 4 carbons in an average amount of 5 to less than 150 moles per 1 mole of the alcohol.

10. (Previously Presented) The paper quality improver for papermaking according to claim 1, wherein the surfactant (B) is water-soluble.

11. (Previously Presented) The paper quality improver for papermaking according to claim 1, further comprising a water-soluble polymer (C) having at least one of a weight-average molecular weight of 1000 to 10,000,000 and a viscosity at 25°C in an 1% aqueous solution of 1 to 4,000 mPa.s.

12. (Previously Presented) The paper quality improver for papermaking according to claim 1, exerting the effect of a standard improved ratio in burst index of -3,000 or more.

13. (Previously Presented) A process of producing a pulp sheet, comprising the steps of adding the paper quality improver for papermaking according to claim 1 to pulp in any step before a papermaking step and papermaking the pulp at a papermaking speed of 200 m/min or more.

14. (Previously Presented) A pulp sheet comprising the paper quality improver for papermaking according to claim 1.

15. (New) The paper quality improver for papermaking according to claim 1, wherein the paper quality improver additionally provides a paper quality improver effect of a standard improved ratio in burst index of --502 or more.

16. (New) The paper quality improver for papermaking according to claim 1, wherein the content of the nonionic monomer having a solubility parameter of 20.5 or less in the monomer composition of the copolymer (A), is 15 to 60% by weight.

17. (New) The paper quality improver for papermaking according to claim 1, wherein the content of the nonionic monomer having a solubility parameter of 20.5 or less in the monomer composition of the copolymer (A), is 20 to 50% by weight.

18. (New) The paper quality improver for papermaking according to claim 1, wherein the weight ratio (A)/(B) of the copolymer (A) to the surfactant (B) is 85/15 to 15/85.

19. (New) The paper quality improver for papermaking according to claim 1, wherein the weight ratio of the copolymer (A) and surfactant (B) to the water-soluble polymer (C), which is [copolymer (A) + surfactant (B)]/[water-soluble polymer (C)], is 98/2 to 20/80.

20. (New) The paper quality improver for papermaking according to claim 1, wherein the copolymer (A) has a weight-average molecular weight of 10,000 to 2,000,000, as determined when using polyethylene glycol as a standard sample in GPC (gel permeation chromatography).

21. (New) The paper quality improver for papermaking according to claim 1, wherein the surfactant (B) has a critical micelle concentration or a solubility in an aqueous phase (25 °C) of 5,000 mg/g or less.

22. (New) The paper quality improver for papermaking according to claim 1, wherein the mixture of the copolymer (A) and the surfactant (B) is water-soluble.

23. (New) The paper quality improver for papermaking according to claim 1, wherein said at least one nonionic unsaturated monomer having a solubility parameter of $26.6 \text{ (MPa)}^{1/2}$ or more is acrylamide.

24. (New) The paper quality improver for papermaking according to claim 1, wherein said nonionic monomer having a solubility parameter of $20.5 \text{ (MPa)}^{1/2}$ or less is a monomer selected from the group consisting of alkyl (meta) acrylic acid of 1 to 40 carbons, vinyl alcohol of 1 to 40 carbons, alkyl-modified (meta) acrylamides of 2 to 40 carbons, alkoxy-modified (meth) acrylamides of 2 to 40 carbons, mono-alkyl esters of maleic acid of 1 to 40 carbons, di-alkyl esters of maleic acid of 1 to 40 carbons, mono-alkyl esters of fumaric acid of 1 to 40 carbons; di-alkyl esters of fumaric acid of 1 to 40 carbons, styrene, vinyltoluene, α -

methylstyrene, ethylene, propylene, butadiene, polyalkylene glycol (meta) acrylates, alkoxy polyalkylene glycol (meta) acrylates, polyalkylene glycol alkenylethers and alkoxy polyalkylene glycol alkenylethers.